Social Network Analysis as a Needs Assessment Tool for Team Building Intervention

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Team building intervention is one of the popular human process interventions focusing on people within organizations and the process through which organizational goals can be accomplished (Cummings & Worley, 2008). Human process interventions are related to individual competencies, interpersonal relationships, and group dynamics. Accordingly, a team building intervention affects mainly groups, thereby influencing individuals and an organization secondarily (Cummings & Worley, 2008; French & Bell, 1984). The main purposes of team building interventions are to develop the problem-solving capacity, to enhance organizational or team’s effectiveness, and to accomplish tasks (Barker, 1986; Liebowitz & DeMuse, 1982; Woodman & Sherwood, 1980). Klein et al. (2009) also insist that such interventions have a positive moderate effect on cognitive, affective, process, and performance outcomes.

To maximize its effect, the team building intervention should be designed based on accurate needs assessment. An intervention developed without sound needs assessment may not be useful to accomplish the purpose of the intervention (Gupta, Sleezer, & Russ-Eft, 2007). Nevertheless, little research has emphasized the importance of needs assessment for a team building intervention. The reason for this lack of research on needs assessment might be that interpersonal relationships or group dynamics, which are areas that can be improved through team building interventions, such as communication, cooperation, or personal relationships among members, are invisible; therefore, it is hard to diagnose where problems are located within groups or teams (Cross & Parker, 2004). Thus, it is necessary to develop a way to assess trainers’ needs for effective interventions and ultimately for improving individual, team or group, and organizational performance.
This study suggests social network analysis (SNA) as a tool to diagnose group dynamics and to assess problems that should be resolved through the intervention. SNA is a set of methods to help researchers to investigate the social structures from the aspects of relations (Scott, 2000). SNA might be useful to understand team processes such as communication, corroboration, and friendship among team members since it focuses on the collections of individuals and the linkages among people in dyads, triads, or larger systems (Wasserman & Faust, 1994). Therefore, through SNA, the needs for team building intervention could be assessed, and effective interventions could be designed, developed, and implemented to increase team effectiveness. For this reason, the primary objective of this study is to suggest a new approach using SNA to assess trainers' needs for team building interventions, which might be a useful needs assessment tool for human resource development (HRD) practitioners.

Method

This study was conducted in a private business organization in South Korea. One 12-member team, which had problems with communication among members, was selected. The team had been reported to the human resource department, and the HRD department was planning to implement a team building intervention. To develop the intervention, there was a need to diagnose what the problem was and where the problem was located within the team. Therefore, this study adopted SNA for the diagnosis.

The needs assessment using SNA followed four steps: interview, survey, data analysis, and problem solving. First, the HRD practitioner interviewed several team members to understand their feelings about their team, and then categorized the problems into three areas: communication, cooperation, and friendship among the team members.
Second, the survey questionnaire was developed to diagnose the real problems using SNA. The questionnaire was composed of two sections. The first section collected demographic information. The second part was composed of three simple questions about formal and informal communications. To measure the communication network among the team members, each participant was asked to list up to five team members with whom he/she had communicated most frequently to perform his/her job. To measure cooperation among the team members, the second question asked each participant to list up to five team members with whom he/she had cooperated most frequently to perform his/her job. The last question asked each participant to list up to five team members with whom he/she had made a close personal relationship. The survey was distributed through e-mail to the participants, who were given two days to respond to it.

The third step was data analysis. The data collected was analyzed with SocNetV 0.90 software. To identify the problems, density, in-degree, and betweenness were measured, and the results were visualized with a sociogram. Density is defined as the number of lines in a sociogram, expressed as a proportion of the maximum possible number of lines. The more points connected to one another, the denser the graph will be (Scott, 2000). Degree, which signifies activity or popularity, refers to the number of nodes adjacent to it. Degree is the sum of all other actors directly connected to ego (Zhang, 2010). Betweenness is defined as the number of times that a node connects pairs of other nodes, who otherwise would not be able to reach one another. A high betweenness actor is able to control the flow of resources between the two that he/she connects. In other words, the actor with higher betweenness is more popular, efficient, or powerful (Zhang, 2010).

The fourth step was to determine what the real problems with the team were and where the problems were located in order to resolve these. For this step, the demographic information
was used to identify the actual problems because the problems might be caused due to gender difference, positions, jobs, the length of service within the team, and so forth. Considering the demographic information, the responses from the participants were analyzed carefully. Based on the result, a team building intervention was developed and implemented to resolve the problems and enhance the effectiveness of the team.

**Results**

The sociograms are shown in Figure 1. Overall, the informal relationship among the team members was close in that the density value was slightly higher than that of formal relationships, such as communication and cooperation. In terms of communication, the result revealed that most members shared information with each other except the team leader and a newcomer who had worked less than one month. It can be expected that the newcomer did not communicate much with other team members regarding his/her job because he/she might be in the on-the-job-training stage, and no specific job had been assigned yet. However, the team leader was pointed out by only one person as a team member to share information frequently; although as a leader, he should be the person at the center of the communication, sharing information with the team members most actively.
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#### Figure 1. The results of social network analysis

<table>
<thead>
<tr>
<th></th>
<th>Formal Relationship</th>
<th>Informal Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
<td>0.34848</td>
<td>0.35606</td>
</tr>
<tr>
<td><strong>Cooperation</strong></td>
<td>12.6667</td>
<td>12.5</td>
</tr>
<tr>
<td><strong>Friendship</strong></td>
<td>0.103306</td>
<td>0.0613932</td>
</tr>
</tbody>
</table>

| Density          | 0.34848             | 0.35606               | 0.39394               |
| In-degree        | 12.6667             | 12.5                  | 13.4167               |
| Betweenness      | 0.103306            | 0.0613932             | 0.0786304             |
Regarding cooperation, the high in-degree values of the two senior members, who had the longest work experience, except the team leader, indicates that they were nominated the most as cooperative members. A possible explanation might be that their work scopes were broader than those of other members, and the juniors in the team frequently asked them for help or cooperation. Although the person nominated as the third cooperative member had only three years work experience, his/her job, IT/security service, explains the reason. His/her job was to support other team members, and he/she was nominated as a person who cooperated with other team members frequently. On the contrary, the in-degree value of the newcomer was zero, meaning that nobody nominated him/her as a cooperative member. Surprisingly, the in-degree value of the team leader was also zero, indicating that the team leader was not nominated by any member. Also, the betweenness of the seniors in the team was high, which means team members were connected through the seniors during cooperative tasks.

Lastly, as the density of personal relationship shows, the friendship among the team members was better than formal relationships within the team. In terms of friendship, most team members had a similar level of in-degree and betweenness except the team leader and the newcomer. This implies that these two people were isolated in terms of personal relationships among the team members.

**Conclusion and Limitation**

Based on the SNA results, it could be surmised that the biggest problem was located with the team leader and the culture in which a newcomer feels unfriendly because he/she is not welcomed. Although a team leader should be the one who leads a team through forming relationships with team members (Graen & Uhl-Bien, 1995), the team leader had been isolated from other team members. Also, it seemed to take time for the newcomer to be assimilated into
the team. To resolve these problems, an eight-hour team building intervention was developed, and all team members participated. The primary focus of the intervention was to break down the wall between the team leader and the team members. Also, the team building intervention provided the opportunity for the newcomer to become familiar with other team members. At the end of the intervention, the team had an opportunity for a heart-to-heart talk to resolve the invisible barrier between the team leader and the team members, and the team leader promised the team members to interact more closely and actively.

Because team building is an ongoing process, it is difficult to see the effect of the team building intervention immediately (Dyer, 1994). Therefore, this study is limited to discuss the improvement of the relationships between the team leader and the team members, and between the newcomer and other team members. Post-diagnosis using SNA is recommended to evaluate the effectiveness of a team building intervention three and six months after the intervention. This will be compared with the pre-diagnosis for the needs assessment, and the comparison may show whether the problem has been improved or other problems within the team have arisen. Hence, the future study will be the evaluation of the team building intervention with SNA to assess how the intervention has met the team needs in terms of communication, cooperation, and friendship among the team members. SNA could be regarded as an evaluation tool as well as a needs assessment tool of team building interventions in the HRD practice.
References


